Federal Interagency Committee on Indoor Air Quality

CIAQ Quarterly Meeting

Wednesday, 21 April 2004

Meeting Minutes

These minutes include the Agenda, Agency Updates and abstract on the Presentation including contact information for the presenter. As usual, this meeting was held in EPA's offices at 1310 L St., NW, Washington, DC 20005-4113, Conference Room 152. For more information about the CIAQ, visit http://www.epa.gov/iaq/ciaq/index.html, or contact Philip Jalbert, EPA Indoor Environments Division (IED), Office of Radiation and Indoor Air (ORIA)(jalbert.philip@epa.gov, 202.343.9431).

The ***next CIAQ meeting*** is Wednesday, July 21, 2004 (1:00 – 3:30 pm); Presentation TBA.

~ AGENDA ~

1:00 pm **Welcome and Introductions**: Barnes Johnson, EPA Co-Chair

1:10 pm **IAQ Updates from CIAQ Member Departments and Agencies**

1 National Institute of Standards & Technology (NIST)
* IAQ Activities, etc., Andy Persily

2 Consumer Product safety Commission (CPSC)
* IAQ Activities, etc., Treye Thomas

3 Department of Housing & Urban Development (HUD)
* Healthy Homes Activities, Ellen Taylor

4 Department of Transportation (DOT)
* Aircraft disinsection/air-curtain technology (video), Arnold Konheim

5 Environmental Protection Agency (EPA)
* Indoor Environments Division (IED) Activities, Tom Kelly

1:45 pm **Presentation and Discussion: Radon in Large Buildings, by David Wilson, Oak Ridge National Laboratory (ORNL)**. Since 1988, the Oak Ridge National Laboratory Radon Program has collected over 80,000 radon measurements and performed hundreds of mitigation in large nonresidential buildings. Analyses and modeling of the testing, diagnostic and mitigation data has resulted in the development of a proposed nonresidential protocol that provides guidance for testing, and approaches for successful mitigation. The scientific basis of the nonresidential protocol, and the lessons learned will be addressed (45 minutes).

~ MEETING MINUTES & AGENCY UPDATES ~

1. NIST did not present an Update

2. Consumer Product Safety Commission (CPSC) Update. On Thursday, May 20th CPSC staff met with the industry and public to discuss Portable Generators on addressing the CO hazard (9:30 a.m.-4:00 p.m.) in Bethesda Towers, Hearing Room 420. CPSC staff requested the meeting. For additional information contact Ms. Janet Buyer, (301) 504-7542.

3. HUD Update - Healthy Homes and Lead Hazard Control

3.1-A HUD/CDC/EPA National Lead and Healthy Homes Grantee Conference is to be held June 20 through 23, 2004 at the Renaissance Orlando Resort at SeaWorld in Orlando, Florida

The conference is being developed to provide information to state and local government, and nonprofit organizations, which are implementing, or interested in obtaining additional information about the healthy homes and lead programs and initiatives being undertaken by HUD, CDC, and EPA. There is no registration fee. Attendees are responsible for all costs associated with travel, lodging and meals.

Registration deadline for the conference is May 1, 2004. Registration is processed at the following web site www.ggadv.com/hud. Detailed information regarding the conference is now available on the web at www.orlandomeetinginfo.com/hud. Information on the Orlando/Orange County area from the Visitors and Convention Bureau is at www.orlandomeetinginfo.com.

3.2-Affordable ComfortConference. To be held April 26 through May 1, 2004 at the Hyatt Regency in Minneapolis, MN. The Conference Health and Safety Track has an number of IAQ sessions, and there are several short courses dealing with indoor contaminants and best practices for prevention and control. Information on the conference and other Affordable Comfort events is available at www.affordablecomfort.org.

3.3-HUD Office of Healthy Homes and Lead Hazard Control Grant Programs for FY2004. The HUD SuperNOFA, which contains the Notice of Funding Availability (NOFA) for the Healthy Homes and Lead Hazard Control Grants, has not yet been published in the Federal Register. Once published, information and application forms will be available at the HUD website: www.hud.gov and from the SuperNOFA Information Center at 1-800-HUD-8929.

4. Department of Transportation (DOT) Update

Mr. Arnold Konheim gave a brief update of DOT's role in development and use of air-curtain technology for aircraft disinsection, and played a short video on the topic for attendees.

Air-Curtain Technology for Aircraft Disinsection

The Department of Transportation, in association with the Departments of State, Defense, Homeland Security and Health and Human Services and the Environmental Protection Agency, has been studying alternative approaches to pesticide-based disinsection of aircraft for preventing flying insects that can be a threat to public health, agriculture or the environment from entering aircraft cabins. There is concern that the current practice in some countries of requiring insecticides to disinsect aircraft can result in discomfort and raise questions about possible adverse health effects to aircraft crews and passengers.

Research has focused on a technique, which was developed by a United States Department of Agriculture laboratory, that consists of operating an air curtain at the entrance to the airplane doors to exclude mosquitoes and other flying insects from entering the airplane cabin. The results of the laboratory-conducted tests showed this technique to be superior to pesticide-based approaches for the following reasons:

* The technique is at least as efficacious as pesticide-based disinsection of aircraft.

* Unlike pesticide-based disinsection, there is no possibility of misapplication of pesticides that may result in possible risk to humans or the environment.

* There is no evidence of any adverse health effects from exposure to the moving air currents characteristic of air curtains.

In March, the United States Government brought this research to the attention of one of the divisions of the International Civil Aviation Organization, a specialized agency of the United Nations, and was successful in getting the division to recommend that non-chemical methods of disinsection be acceptable.

Attachment

Proposed Standard for Chapter 2 of Annex 9. Contracting states shall allow non-pesticidal approaches to aircraft disinsection that have been shown to be at least as efficacious as those methods and treatments for chemical disinsection that have been approved by the World Health Organization.

5. Environmental Protection Agency (EPA) Update

The EPA Update was in two parts, one from the Indoor Environments Division (IED) and the other from the Office of Research and Development (ORD)

5.1 Indoor Environment Division

5.1.1-Radon – Federal Agency Activities. At the last CIAQ meeting, Elizabeth Cotsworth asked for your help with our effort to update information about current Federal agency radon policies and activities. Thanks to GSA, the Navy and Bonneville Power Administration (BPA) for

providing that information. For those agencies that did not respond, I'd like to again ask for your help and that you provide the information to Phil Jalbert via email (jalbert.philip@epa.gov). The details of the request can be found in the minutes of the January 21st CIAQ meeting on the CIAQ website (http://www.epa.gov/iaq/ciaq/index.html). We need to show what the Federal government is doing about radon if we are to persuade others to take action on radon - the Federal government must lead by example. Please help us to do that (IED-POC, Philip Jalbert, 202.343.9431, jalbert.philip@epa.gov).

5.1.2-Schools - 'Healthy Schools Day' & 'Schools Building Week'. This week is Schools Building Week, and Monday was Healthy Schools Day. This is the 8th annual School Building Week event sponsored by the Council of Educational Facility Planners International (CEFPI). The event draws national attention to the importance of well planned, high performing, healthy schools and their impact on the learning environment. EPA's Indoor Air Quality Tools for Schools Program is a co-sponsor (IED-POC, Bob Axelrad, 202.343.9315, Axelrad.Bob@epa.gov).

5.1.3-Schools - Healthy School Environments Initiative. On April 14th IED participated in an Office of Prevention, Pesticides & Toxic Substances (OPPTS) meeting in Atlanta that discussed the EPA-wide effort to better coordinate and integrate schools programs. Recently, OPPTS and the Office of Solid Waste & Emergency Response (OSWER) had separately announced initiatives for making schools safer by improving management of chemicals (IED-POC, Bob Axelrad, 202.343.9315, Axelrad.Bob@epa.gov).

5.1.4-Air Toxics - Workshop. On April 16th IED presented a session entitled "Techniques for Leading Successful Community-based Air Toxics Campaigns" at the 2004 Air Toxics Workshop in RTP, N.C. The Air Toxics Workshop is an annual forum for EPA, State, local, and Tribal pollution control personnel to share ideas and exchange information on current and future air toxics programs. The event is co-sponsored by the EPA, the State and Territorial Air Pollution Program Administrators, and the Association of Local Air Pollution Control Officials (IED-POC, Bill Long, 202.343.9733, Long.Bill@epa.gov).

5.1.5-ETS - Latino Community Outreach. The Environmental Tobacco Smoke (ETS) Team will be increasing its outreach efforts to Latinos and other diverse populations through a newly awarded 3-year contract to Hispanic Marketing & Educational Communications, Inc (HME). The effort includes strategies, developing and implementing outreach efforts and leveraging relationships with grass roots organizations (IED-POC, Sheila Brown, 202.343.9439, Brown.Sheila@epa.gov).

5.1.6-ETS - Partnership with Head Start Bureau. EPA and HHS will sign a Memorandum of Understanding to reflect their collaborative effort to motivate Head Start parents to make their homes smoke-free (IED-POC, Helga Butler, 202.343.9335, butler.helga@epa.gov).

5.1.7-Asthma - Asthma Awareness Month. May is Asthma Awareness Month and May 4 is World Asthma Day. In order to help state and local organizations plan events across the

country to raise overall asthma awareness, IED has developed an event planning kit. This kit is available on IED's Web site (www.epa.gov/asthma). In addition, IED has developed several new outreach materials including a children's activity book in English and Spanish, *Dusty Funbook,* a Hispanic Video News Release (VNR) and a Hispanic educational video*, Controlando los Factores del Asma*. These materials can be ordered by calling 1-800-438-4318. IED is highlighting events on their Web site through an interactive map. Be sure to submit information about your event so it can be featured on this map (IED-POC, Kim Durkin, 202.343.9443, durkin.kim@epa.gov).

5.1.8-Asthma - CDC 2004 National Asthma Conference. The 2004 National Asthma Conference sponsored by CDC was held in Atlanta on April 13-16. The conference brought together 500-600 federal, state and local health officials, environmental and public health professionals, school administrators, health care providers, and others involved in asthma management. IED presented sessions on "Media and Marketing", "Media Training for Non-Profits" and "Asthma and the Environment" (IED-POC, Alisa Smith, 202.343.9372, smith.alias@epa.gov).

5.1.9-IAQ - Indoor Air Quality Green Building Session at the Science Forum. "Healthy Communities - One Building at a Time," a session proposed by ORIA, ORD, and OAP, has been selected for the 2004 EPA Science Forum (June 1-3). The session is designed to illustrate the importance of scientific research in the area of indoor environmental quality, and the mechanisms by which this research can influence behavior to design and operate healthier buildings (IED-POC, David Mudarri, 202.343.9053, mudarri.david@epa.gov).

5.2 EPA/ORD Indoor Environment Management Branch (IEMB) Update

5.2.1-Buy Clean. Buy Clean is an EPA initiative, started in 2000, to partner with key stakeholders – such as states, schools, public health professionals, and trade associations – to promote the purchasing of products and services for healthy indoor environments in schools and to identify effective mechanisms for the development, marketing, and procurement of lower risk products. As part of this effort, IEMB is evaluating pollutant emissions from hard surface cleaners and developing numerical models and tools for evaluating these products. Three types of pollutants are of primary concern: (1) glycol ethers (2) hazardous air pollutants (HAPs), and (3) secondary pollutants, which do not exist in the formulations, but can be formed during storage and use. A screening level model has been developed to allow building managers to compare cleaners based on potential hazardous effects when they make procurement decisions. Contact Zhishi Guo, 919-541-0185, guo.zhishi@epa.gov

5.2.2-Method for Evaluating Mold Growth on Porous Surfaces. Testing of surfaces for fungal growth is usually performed with sterile cotton swabs or RODAC plates. These methods are useful for testing the presence of bio-contaminants on non-porous surfaces. However, porous surfaces favor mold growth and are inaccessible for testing using the "swab" or RODAC plate method. The objective of this study is to develop, evaluate, and standardize a bulk sample

test method using a masticator-blender that could be used for the analysis of porous and non-porous surfaces. The first samples being tested are ceiling tiles inoculated with pure and mixed cultures of mold. Additional building materials to be tested are drywall and carpet. Contact Doris Betancourt, 919-541-9446, betancourt.doris@epa.gov.

5.2.3-Particulate Matter Resuspension from Flooring Surfaces. A study to investigate particulate matter re-suspension from flooring surfaces is underway. Research is being performed in private homes, at the IEMB Test House and also at RTI International, RTP, NC. The first part of this study includes developing a method for re-suspension sampling as well as developing emission factors for particle re-suspension from medium pile carpeting. These emission factors will then be applied, by particle size, to various contaminants such as metals, biologics, and semi-volatile or particle based pesticides. Sampling is being performed at numerous heights to give an indication of child versus adult exposures. Re-suspension of fibers is also being investigated for EPA Region 2 (NY City). Contact Jacky Rosati, 919-541-9429, rosati.jacky@epa.gov.

5.2.4-Ozone – Air Freshener Reaction Products. A project is underway to investigate the reaction of ozone and fragrance compounds in the indoor environment. During the summer months, ozone is often found at elevated concentrations out of doors and it may infiltrate the indoor environment. Fragrance compounds are common constituents of numerous consumer products including cleaners, air fresheners, and perfumes. Reaction products that may be of concern to indoor occupants are particulate matter and carbonyl compounds such as formaldehyde. Contact Mark Mason, 919-541-4835, mason.mark@epa.gov.

5.2.5-Microwave Popcorn Emissions. A study to characterize emissions from microwave popcorn is underway. Currently, approximately 40 retail microwave popcorns are being screened to identify the major compounds emitted during popping and bag opening. Also, research is ongoing to investigate emissions from the microwave popcorn bags sans popcorn and flavorings. The next phase of this work will involve quantifying compounds emitted during popping and opening for 10 popcorns that were found to have more diverse emissions. This study was reported on the front page of the St. Louis Post-Dispatch on Sunday March 7th, 2004 and the AP internationally on March 11th. Contact Jacky Rosati, 919-541-9429, rosati.jacky@epa.gov.

5.2.6-Determination of the Rate of Moisture Wicking through Gypsum Wallboard.
Construction techniques often leave buildings exposed to inclement weather. To save time during construction, gypsum wallboard is often installed prior to adequate protection from the elements. Water that enters through the poorly sealed building shell can wet and slowly saturate the exposed wallboard through direct contact with standing water. Plumbing leaks or failures may contribute to standing water or excess moisture. Poor HVAC construction and condensate accumulation can also cause the unwanted introduction of moisture. A potential result of repeated or prolonged exposure of wallboard to water is the formation of biological contamination. HVAC system operation can then distribute the biological contaminants and expose many building occupants to harmful allergens. Little is know about the capillary (wicking)

characteristics of wallboard. Quantification of the rate of moisture absorption and vertical movement (wicking) was performed on a variety of wallboard materials. The information is intended to guide remediation of water-damaged buildings and the avoidance of mold contamination. Contact Dale Greenwell, 919-541-0148, greenwell.dale@epa.gov.

5.2.7-Cooperative Agreement with Syracuse University. Research funded by an FY02 congressional earmark for $670K is underway at Syracuse University. IEMB is providing oversight of current projects on bio-contaminants, particulate matter, source characterization, and air cleaning. For information on these projects, contact Zhishi Guo, 919-541-0185, guo.zhishi@epa.gov. A larger effort funded by an FY03 earmark for $4,469K is under development, and review of proposed projects is in progress. A significant FY04 follow-on earmark is anticipated. Contact Bruce Henschel, 919-541-4112, henschel.bruce@epa.gov.

Homeland Security Projects Related to Indoor Air Quality

5.2.8-Performance Verification on Indoor Air Filters that Protect Against Biological Threat Agents. The EPA's National Homeland Security Research Center recently completed performance verifications of ten indoor air filters designed to protect building occupants from biological attack from terrorists. EPA's independent measurement of manufacturers' performance claims promotes public confidence and is useful in design, operation, and the decision-making process for the selection of ventilation systems for large buildings. The performance verification was conducted by the EPA's Environmental Technology Verification (ETV) Program. See verification results at http://www.epa.gov/etv/verifications/vcenter10-1.html or contact Bruce Henschel, 919-541-4112, henschel.bruce@epa.gov.

5.2.9-Building Decontamination. The first phase of testing has been completed for three technologies: hydrogen peroxide vapor, formaldehyde gas, and chlorine dioxide gas. Results will be published in reports in the next few months. EPA is looking for technologies to include in the next phase of testing. Contact John Chang, 919-541-3747, chang.john@epa.gov.

5.2.10-Small-Scale Solvent Spills Inside Buildings. A research project is underway to characterize the emissions from small-scale spills – either accidental or intentional – of toxic liquids inside buildings. The objectives are to (1) experimentally measure the emission profiles and (2) develop emission models for predicting the chemical emission rate following spills. Three types of liquids will be tested: single-component liquids, non-aqueous mixtures, and aqueous solutions. Preliminary test results suggest that the models work reasonably well for single-component liquids spilled on hard surfaces, but failed to predict the emissions when they are spilled on fleecy surfaces such as carpet. Several modeling options are being evaluated to resolve this problem. Models for mixtures and aqueous solutions have been developed and will be evaluated with experimental data. Contact Zhishi Guo, 919-541-0185, guo.zhishi@epa.gov.

5.2.11-Bench-Scale Tests on Thermal Destruction Using Bio-contaminated Building Materials. The main objective of this project is to determine the operating conditions

required for efficient incineration and complete destruction of *Bacillus anthracis* spores. The IEMB BIOLAB, in collaboration with the Air Pollution Technology Branch (APTB), is performing bench-scale tests on thermal destruction of building materials contaminated with *Bacillus anthracis* surrogates. The BIOLAB is analyzing the microbial survivability of inoculated samples before and after exposure to elevated temperatures over various periods of time. Testing of ceiling tiles inoculated with a known concentration of *Bacillus subtilis* spores was **completed in** February 2004. Heating tests of drywall inoculated with *Bacillus subtilis* will start in May 2004. Contact Doris Betancourt, 919-541-9446, betancourt.doris@epa.gov.

5.2.12-Microbial Survivability Test for Rotary Kiln Incinerator Residues. The main objective of this project is to determine the most efficient incineration method to destroy *Bacillus* species including *Bacillus anthracis*. The IEMB BIOLAB, in collaboration with APTB, is determining the microbial survivability of *Bacillus anthracis* surrogates in the combusted residues from the normal operation of a rotary kiln waste incinerator. Samples to be incinerated will consist of carpet contaminated with *Bacillus* surrogates. The BIOLAB will prepare samples (both sterile & inoculated building materials) and will analyze residues for microbial survivability after incineration. Contact Doris Betancourt, 919-541-9446, betancourt.doris@epa.gov.

5.2.13-Scale-Up of Indoor Sink Effect Models. The purpose of this project is to improve predictions of indoor air concentrations of toxic industrial chemicals and building decontamination agents by improving sink effect models. Current indoor air models significantly under-predict the effect of sinks on indoor air concentrations in building (the sink effect can decrease peak concentrations and increase long-term concentrations). As a result, an effective dose of decontaminant may not be attained, or personnel may prematurely re-enter a contaminated building. So far, a literature survey has been conducted, and a paper on it submitted to the Air and Waste Management Association's annual meeting in June. Initial laboratory work, in small (53-liter) test chambers has begun. Contact Betsy Howard, 919-541-7915, howard.betsy@epa.gov.

5.2.14-Residential Safe Havens. The objective of this study was to evaluate the effectiveness of sheltering in place in a residence, as outlined in the U.S. Department of Homeland Security guidance. An improved method was developed for determining the air-flow rate for a shelter inside a house. Experiments were performed at the IEMB Test House, and measured air-flow rates were used to determine protection factors for various scenarios. Contact Jim Jetter, 919-541-4830, jetter.jim@epa.gov.

5.2.15-Recent Publications

Dean TR, Betancourt D, and Menetrez MY. A rapid DNA extraction method for PCR identification of fungal indoor air contaminants. J Microbial Methods. 2004 Mar; 56(3): 431-4.

Guo Z, Jetter JJ, and McBrian J. The rates of polycyclic aromatic hydrocarbon emissions from incense burning. Bulletin of Environmental Contamination and Toxicology. 2004 Jan; 72: 186-193.

Guo Z and Roache N. Overall mass transfer coefficient for pollutant emissions from small water pools

under simulated indoor environmental conditions. Annals of Occupational Hygiene. 2003 Jun; 47(4): 279-286.

Henschel DB, Fortmann RC, Roache N, and Liu X. Potential for reducing indoor styrene exposure from copied paper through use of low-emitting toners. Journal of the Air and Waste Management Association. 2003 Nov; 53(11): 1347-1354.

Liu X, Mason MA, Krebs KA, and Sparks LE. VOC emissions, degradation, and kinetic simulations of large chamber tests on indoor air fresheners. Environmental Science and Technology (accepted, published on web, not yet in print).

Menetrez MY and Foarde KK. Emission exposure model for the transport of toxic mold. Indoor Built Environ. 2004 Feb; 13: 75-82.

Stout II DM and Mason MA. The distribution of chlorpyrifos following a crack and crevice type application in the U.S. EPA indoor air quality research house. Atmospheric Environment. 2003 Dec; 37(39/40): 5539-5549.

6. Presentation and Discussion: Radon in Large Buildings, by David Wilson, Oak Ridge National Laboratory (ORNL). Since 1988, the Oak Ridge National Laboratory Radon Program has collected over 80,000 radon measurements and performed hundreds of mitigation in large nonresidential buildings. Analyses and modeling of the testing, diagnostic and mitigation data has resulted in the development of a proposed nonresidential protocol that provides guidance for testing, and approaches for successful mitigation. The scientific basis of the nonresidential protocol, and the lessons learned was addressed. For more information or copies of his presentation, contact David Wilson at Oak Ridge (865-435-9890, wilsondl@ornl.gov). For an email copy of the presentation only, you may also contact Phil Jalbert (jalbert.philipo@epa.gov, 202343.9431).

7. Attendees

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